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(54) FORMATION OF RESIST PATTERN

(57) Abstract:

PURPOSE: To enhance a high resolution property and a dry-etching-resistant property by a method wherein, after a pattern has been exposed and a resist composition pattern has been formed, high-energy radiant rays are irradiated and a resist pattern whose surface is covered with a polymer film containing an aromatic ring is formed.

CONSTITUTION: A nitrocellulose thin film 2 is formed on the surface of a silicon substrate 1; the thin film 2 is irradiated with an argon fluoride excimer laser beam 4; nitrocellulose in a part irradiated with the laser is decomposed and removed; a pattern 2 of the nitrocellulose thin film is formed. Then, the substrate 1 is irradiated with an electron beam 5 in the air; an active radical 6 which can start addition polymerization is generated on the pattern 2, coupled with oxygen in the air and transformed into a hydroperoxide and a diperoxide which are comparatively stable at room temperature. After that, a styrene monomer gas 7 is introduced and heated; a graft polymerization reaction is caused; a graft polymer film 8 of styrene is formed on the pattern. Since an aromatic ring is introduced in this manner, a dry-etching-resistant property is enhanced sharply; when a resist pattern is formed, high resolution can be obtained.

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